question arose, had a syringomyelia formed at the site of the old scar of the early acute lesion.

Dr. M. G. Schlapp said he had seen one case in which the cord lesion following typhoid fever proved to be a complete transverse myelomalacia involving two segments. The autopsy showed a thrombosis of the blood vessels, with resulting softening of the two segments of the cord.

Dr. Nathan E. Brill said that myelitis was a rare complication of typhoid; in fact the typhoid bacillus but rarely produced inflammatory or degenerative changes in the central nervous system. Rarely had a general or local poliomyelitis been recorded, though a few cases of either form were reported in literature. The common form of infection in typhoid was of the meninges, and in those cases the typhoid bacillus had been found in the cerebrospinal fluid. Even this was relatively rare. Neuritis of a peripheral nerve or nerve plexus and polyneuritis were also relatively uncommon.

In the case shown by Dr. Cunningham it was possible that there may have been a neuritis of some of the branches of the brachial plexus, and some years later some other involvement of the nervous system: a syringomyelia, if such be present in this case, may have been superimposed.

STUDIES ON THE PATHOLOGY OF POLIOMYELITIS ANTERIOR ACUTA BASED ON THE AUTOPSY FINDINGS IN FIVE CASES

By I. Strauss, M.D.

The author stated that from the picture of poliomyelitis acuta which he had presented, it was clear that the following conclusions might be drawn:

1. That there were both interstitial and parenchymatous lesions, but that the interstitial were of fundamental importance, and the latter secondary.
2. That the ganglion cells were affected only when in contact with the interstitial process.
3. That the interstitial process was dependent upon the vessels for its character and its localization.
4. That the lesion, while generally most marked in the anterior horns, was not confined to that portion of the gray matter, and hence the word "anterior" should not be used to designate the condition.
5. That the white matter of the cord was the seat of inflammatory changes of minor importance.
6. That the pial infiltration was an essential element in the disease, and might be the origin of the infective agent.
7. That the involvement of the medulla, pons and basal ganglia always occurred in the fatal cases, though clinical experience in the last epidemic had shown that such involvement did not mean a fatal issue necessarily.
8. That in striking contrast to the cord, the ganglion cells in the medulla, pons and basal ganglia, even when near infiltrated zones, escaped serious alteration.
9. That the brain cortex may show evidences of vascular irritation and sometimes infiltration.
10. That the edema which is present plays an important role in explaining the transitory nature of the symptoms in the non-fatal cases.
11. That the predominating role ascribed to the central artery by previous observers was unjustifiable.

12. That there was no evidence of thrombosis.

13. That apparently the infective agent might affect any part of the brain stem in its initial lesion.

14. That it could not be determined from a study of the pathological histology whether the infection had a hematogenous or lymphogenous origin.

15. That while the central nervous system was the seat of the principal lesion in poliomyelitis acuta, the changes in the internal organs of the body pointed to a general infection.

16. That the acute inflammation of the lymphatic apparatus connected with the interstitial tract might indicate the path of entrance of the infective agent.

Dr. Joseph Fraenkel said that Dr. Strauss's very complete report of the pathology of poliomyelitis acuta had helped him to understand some of the clinical features of the disease that had hitherto puzzled him. According to Dr. Strauss's paper, we were now told to look upon poliomyelitis as an inflammatory condition of the entire nervous system due to some obscure toxic agent, and that we should no longer regard it as a disease directly localized to the anterior horn. Accepting that interpretation, Dr. Fraenkel said he failed to understand why the final clinical phenomena of the disease were unquestionably referable to a lesion confined to the anterior horns and immediate vicinity.

Dr. J. Ramsay Hunt said that Dr. Strauss had enjoyed unusual opportunities in the pathological study of these five cases of acute anterior poliomyelitis. An interesting feature in the cases reported was the presence of inflammatory change not only in the gray matter of the cord, but also in the white substance and in the meninges, which was in harmony with recent pathological studies in a form of inflammatory reaction of the gray matter in the brain, namely, the acute polioencephalitis of Wernicke. More recent investigation of cases belonging to this type has shown evidences of inflammation not only in the gray substance around the aqueduct, but also disseminated in the white matter of the brain and brain-stem.

Dr. Hunt said he quite agreed with Dr. Strauss that perhaps most of the cases of so-called Landry's disease belonged to the same pathological type as the acute poliomyelitis, but he did not believe that all cases of so-called Landry's paralysis should be grouped under this head. There recently came under the speaker's observation a patient who presented a typical clinical picture of so-called Landry's paralysis. There was no disturbance of the functions of the bladder or rectum and no suggestion of sensory symptoms. In the muscles involved there was a complete abolition of all reflex action and no electrical response. The ascending paralysis gradually progressed, and death occurred in the course of eight days. At the autopsy, no definite changes could be found in the spinal cord or peripheral nerves. In a few segments of the anterior horn there was a suggestion of round-celled infiltration, one or two hemorrhages, but these were very insignificant. In such cases there must be a toxic condition which exerted its influence on the peripheral motor neurone.

Dr. I. Abrahamson said the cases which formed the basis of Dr. Strauss's report occurred during an epidemic of acute anterior poliomyelitis during which almost all the severe cases showed decided meningeal symptoms. The speaker said that in very many of the cases that came under his observation in the course of that epidemic he was able to elicit other than the usual symptoms which we were apt to ascribe to an anterior poliomyelitis. Since then the sporadic cases he had seen again closely resembled our old conception of the disease, the meningeal symptoms retiring to the background of the clinical picture. The probabilities were that the cases occurring during an epidemic differed in their clinical features from the sporadic cases.

Dr. William M. Leszynsky said that during the last epidemic of acute anterior poliomyelitis he saw a large number of cases that could be hardly classified under that name as the disease was described and understood in former years, and the studies of Dr. Strauss indicated to his mind that the five cases reported could not be classified in that category. Otherwise, our present conception of acute anterior poliomyelitis had to be changed, and he was inclined to indorse the suggestion made by Dr. Strauss that the name of this disease be modified.

Dr. B. Onuf said that some time ago he presented a case to this Society which showed some interesting features, both anatomically and clinically. Anatomically, it showed the lesions of poliomyelitis, very similar to those described by Dr. Strauss. There were numerous foci of round-celled infiltration, which were chiefly found in the anterior horns, but also outside of them. Clinically, the case could be regarded as one of Landry's paralysis. The symptoms began in the lower extremities and then extended to the upper. Another interesting feature of the case was that symptoms of severe lead poisoning had directly preceded those of the Landry's paralysis.

Dr. Herman Schwarz said that during an epidemic we were apt to see variations and abortive forms of any particular disease, and this was so during the recent epidemic of acute poliomyelitis. While some of the cases observed at that time showed evidences of bulbar or meningeal involvement, there were many others that conformed very closely to our old-fashioned ideas of poliomyelitis. The speaker said he had seen one acute case since the epidemic in which there was meningeal irritation with resulting paralysis.

The President, Dr. Sachs, thought it was difficult to over-estimate the value of Dr. Strauss's communication on account of the early period after the onset of the disease at which the cases were examined, as well as the thoroughness of the studies that were made. They certainly gave us a better and more comprehensive understanding of the pathology of acute poliomyelitis; they showed that it was by no means the narrow disease, in an anatomical and clinical sense that we formerly regarded it, and in that respect they verified the findings of the special committee that had been appointed to study the disease during the last epidemic. Dr. Strauss's findings gave corroborative evidence that in acute poliomyelitis the entire central nervous system might be involved to a greater or less extent, and showed that the symptomatology of the disease would now have to be studied from a different point of view. It would be equally interesting, Dr. Sachs said, to learn the pathological conditions during the intermediate and terminal stages of the disease and to see what happened to these various foci. Did they disappear with the often remarkably rapid disappearance of the paralysis in many of these cases? Also, was the degeneration of the ganglion cells in direct relation to the interstitial disease? The toxin of the disease may have some independent effect on these ganglion cells, and it might not be exclusively an interstitial disease, as we believed. Dr. Sachs said he did not understand that Dr. Strauss had suggested that the name "poliomyelitis" be abolished; he only proposed to drop the term "anterior."

Dr. Strauss, in closing, replying to Dr. Fraenkel, said that the sensory symptoms, so far as they were observed, were irritative in character and could be explained either by the meningeal infiltration or the infiltration of the ganglion itself. Why the anterior horn lesion was the most prominent one, no one had been able to explain. It might be assumed that it was the point of greatest destruction because of its free supply of blood vessels and lymphatics. The speaker said he did not mean to propose substituting the name "infiltrating myelitis" for "poliomyelitis"; he simply said it belonged to the class of infiltrating myelitis. In answer to Dr. Abrahamson, the speaker said he agreed with Dr. Schwarz that during the last epidemic there were many cases of the classical type, and these abnormal ones would not have come into his hands for study had they not been of an abnormal type. There was no reason to suppose that with the old classical cases we might not have these symptoms of meningeal involvement, perhaps of a mild type, and which would clear up much more rapidly than they would in the severe cases.

A CASE OF SYRINGOMYELIA WITH NEURO-EPITHELIOMA, WITH SOME REMARKS ON THE ETIOLOGY OF SYRINGOMYELIA

By M. G. Schlapp, M.D.

The speaker reported a case which showed symptoms pointing to the presence of a tumor involving the first, second, third, fourth and partially the fifth posterior lumbar roots on the right side. There were also present slight symptoms pointing to pressure on the spinal cord. The diagnosis of extra-medullary tumor was made and an operation was recommended. Upon opening the spinal canal in the region of the first lumbar segment, and removing two or three arches of the vertebræ, no tumor was found. The patient, two weeks after the operation, developed a purulent meningitis which proved fatal a month later.

The autopsy showed an unusual condition. From the upper cervical segments down to the filum terminale was found a central gliosis. In the eleventh and twelfth dorsal and first lumbar segments there was found a neuro-epithelioma which involved the whole transection of the cord in those three segments. This tumor, according to the clinical symptoms present before the operation, could not have existed at that time; consequently, Dr. Schlapp thought that the tumor must have developed afterwards and in consequence of the operation.

In connection with the report of this case, the speaker considered the question of the etiology of the gliosis and the possible relationship between the gliosis and the neuro-epithelioma. He called attention to the fact that with the exception of one or two cases of neuro-epithelioma on record, all showed that the latter type of tumor developed very likely on the basis of a central gliosis.

Dr. Fraenkel said the sections shown by Dr. Schlapp—at least those that he had examined—showed a connection between the tumor formation and the central canal, and he asked whether all the sections showed such a connection. He also referred to Leyden's original conception, advanced many years ago, that syringomyelia was the result of localized sacculation of the central canal.

Dr. Hunt said the case reported by Dr. Schlapp showed that an exploratory operation for tumor of the cord has disadvantages quite apart from the possibility of infection that may follow. The speaker said he had at